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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of	)	
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Advanced Television Systems	)	
and Their Impact Upon the	)	MM Docket No. 87-268
Existing Television Broadcast	)	
Service	)	
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Fifth Further Notice of	)	
Proposed Rule Making	)	

REPLY COMMENTS OF THOMSON CONSUMER ELECTRONICS

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REPLY COMMENTS OF THOMSON CONSUMER ELECTRONICS

I. Introduction

Thomson Consumer Electronics ("Thomson") hereby replies to the comments filed on July 11, 1996 in response to the Commission's Fifth Further Notice of Proposed Rule Making ("NPRM") in its Advanced Television ("ATV") proceeding. In the NPRM, the Commission proposes to adopt the ATSC Digital Television ("DTV") Standard recommended by its Advisory Committee on Advanced Television Service ("Advisory Committee") in its entirety as the single standard to be used by terrestrial broadcast television licensees in their conversion to digital technology.

Thomson is a member of the Advanced Television Systems Committee ("ATSC") and the Digital HDTV Grand Alliance ("Grand Alliance"), and joins in the extensive and thorough reply comments submitted by those organizations. We also offer these additional comments to assist the Commission in bringing this historic effort to develop a new standard for advanced television service to a rapid and successful conclusion.

We believe that the voluminous comments submitted in response to the NPRM provide overwhelming support for the Commission's tentative decision to adopt the ATSC DTV Standard recommended by the Advisory Committee. Ninety-one broadcast organizations and virtually everyone else *directly* involved in the provision of free over-the-air television are unanimous in their support for rapid adoption of the standard. By contrast, some members of the computer industry and some other parties not directly involved in broadcast television raise a variety of objections. These objections are not sound and arise out of misunderstandings, mistaken assumptions, and most of all, a focus on the narrow concerns of a single industry or application, with little or no regard shown for the Commission's principal goals in this proceeding: to upgrade the technical quality of free, over-the-air television, including its ability to provide new information services to the public, so that it will be able to compete in the years and decades to come; and to recover large blocks of valuable television spectrum as rapidly as possible.

We believe that two things are critical if the Commission is to accomplish these objectives. First, the various industries involved need a single, complete standard, embraced by the Commission, to provide the clarity, certainty, and stability needed to move forward together, and to open the floodgates for the substantial investments necessary by broadcasters, manufacturers, and consumers to make a successful and rapid transition to digital technology. In addition, such a standard must be based on a proven, tested, flexible, and extensible system, so that service and equipment providers and consumers can be assured that their investments will not be wasted.

Second, that standard must provide full high-definition television ("HDTV") capability from the first day of the transition. As our research has shown, and as we have highlighted in this proceeding and especially in our comments on the Fourth NPRM and in the Commission's December, 1995 *En Banc* Hearing, HDTV, as the centerpiece application of digital television, will provide quantum improvements in picture quality and sound that will motivate consumers, including those of modest means, to invest in digital television.

The Commission has in hand everything it needs to accomplish its objectives in this proceeding. Its Advisory Committee has recommended a single, complete standard based on a proven, exhaustively tested system that represents the world's best digital television technology. Moreover, this standard delivers full high-definition capability on day one, giving broadcasters the ability to offer the kind of dramatic improvements in picture quality that will drive a rapid transition to digital television, hastening the day when the Commission can reclaim and reuse valuable spectrum. Finally, the Advisory Committee, after almost a decade of devoted effort, has developed a broad, strong industry consensus, at least by the parties directly involved in broadcast television, that gives it a mandate to move ahead.

Indeed, the key step that remains now, is for the Commission to act -- to follow through on its commitment to set a standard, the commitment that has motivated and guided the Herculean industry effort and investment over the past decade. Taking this last crucial step will trigger the further significant investments that broadcasters and manufacturers must make to bring the benefits of this technology to the viewing public, creating and preserving high paying jobs and engendering economic growth in the process.

II. The Commission Should Adopt the Entire ATSC DTV Standard

In our initial comments we described in detail the benefits of a single mandated standard to provide the kind of clarity, certainty, and stability that will cause investors, broadcaster, manufacturers and consumers to invest in mutually beneficial ways in deploying this new technology. The great majority of commenters agree emphatically with this position, including all of the parties directly involved in the provision of broadcast television service.

Two groups oppose a Commission-mandated standard: the cable industry, as reflected in the comments of the National Cable Television Association ("NCTA") and Tele-communications, Inc. ("TCI"); and some members of the computer industry, led by the Computer Industry Coalition on Advanced Television Service ("CICATS"). Both groups cloak their real motivations behind a professed concern that a government-mandated standard

would thwart innovation and lock the nation into obsolete technology. These concerns are baseless, however, as we demonstrated in our initial comments where we described the benefits of a single, clear, mandated standard, and the unprecedented flexibility and headroom for growth that the proposed ATSC DTV Standard provides.[1]

In the case of cable, we believe that their sudden opposition to setting an FCC standard, after participating fully in the process to establish one, arises first from their concern that the Commission might impose the same standard on cable. If they can persuade the Commission not to set a terrestrial standard, it's virtually certain that the Commission would not impose a standard on cable.[2] But in fact, their concern goes deeper than that, as NCTA's comments make clear:

> "A government-mandated standard would have two effects on other technologies. First, by becoming a government 'rule,' the standard generates momentum for extending itself into other technologies, like cable, that have no need for a standard. That is because incumbents tied to the standard will want to extend it elsewhere. There is the likelihood that it will extend to other video providers and the computer/software industries -- even though over-the-air broadcasting is the primary source of television for just 30% of homes. Second, even if government does not apply the standard elsewhere, the existence of a standard freezes improvements in other technologies as duplication of the standard becomes the easiest, though not necessarily the best, form of interoperability.

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[1]In a declaration attached to the NCTA Comments, Bruce Owen gives a discussion of the role of standards and concludes that there are few benefits and may be substantial costs of mandating the DTV Standard. However, Owens' own statements, we believe, demonstrate just the opposite. "The production of television service requires intricate coordination of numerous agents operating in different locations at different stages of the industry. Standards arise and have economic value because they facilitate the coordination of economic activities." (Video Economics, Bruce M. Owen and Steven S. Wildman, Harvard University Press, 1992.) We believe mandating the proposed ATSC DTV Standard delivers all of these benefits of a standard, without any appreciable costs, because of its tremendous flexibility and extensibility.

[2]In our initial comments (at 14), we did not advocate mandating the ATSC DTV Standard for cable or other non-broadcast delivery media. We said that "as voluntary standards activities continue in the cable industry, as well as for DBS, MMDS and ITFS services and for open video systems, it is likely that many elements of the terrestrial ATV standard will also be incorporated in emerging standards in these industries. Indeed, the ATSC DTV Standard should provide the core for these emerging standards. We believe that the development of these standards will promote the early availability of digital television, including HDTV, over all of these other media as well as terrestrial broadcasts, without causing undue burdens on cable operators or other providers."

This single paragraph speaks volumes about the cable industry's self-serving motivation in opposing FCC adoption of a terrestrial broadcast standard. First, although we have not advocated *imposing* a standard on cable, we wonder how many other parties, including consumers, would agree with their assumption that cable has no need for a standard. Second, their statement that "just 30%" of homes rely on over-the-air television as their primary source of television dramatically understates the importance of broadcast television, since something like 70% of the hours viewed on cable systems are of local over-the-air stations, and since many cable customers use over-the-air receptions for nonprimary TV sets.

Most important, this statement shows a callous disregard for the Commission's primary objective in this proceeding -- upgrading the quality of free over-the-air television so that it can compete effectively in the years and decades to come. The *cable industry's interests* might be well served if this historic effort to make quantum improvements in broadcast television is derailed, but such a result is hardly in the *public interest,* and would fly in the face of the Commission's primary goal. Thomson does not advocate *forcing* the cable industry to adopt the proposed terrestrial broadcast standard in whole or in part, but we *do* believe that the effort to upgrade free TV should proceed unimpeded, and that cable and other video delivery media should not be shielded from the need to make whatever adjustments in their own plans for digital television service that are necessary to reflect changes in broadcast television.

Accordingly, the cable industry's arguments that mandating a terrestrial broadcast will retard innovation, thwart competition, and lock in obsolete technology, are self-serving and unconvincing, and are not grounded in the public interest. The Commission should dismiss these claims, and adopt the proposed terrestrial broadcast standard as rapidly as possible.

In similar fashion, some members of the computer industry profess a great concern that mandating a standard will lock in obsolete technology, when in fact, their real complaint is that the proposed standard is not designed *exclusively* to accommodate their vision of one narrow aspect of this digital television revolution -- the potential emergence of "converged"

personal computer/television products, notwithstanding the fact that the ATSC DTV Standard is undeniably, far and away, the most computer-friendly, easily interoperable television system ever conceived.

As demonstrated in detail in the lengthy responses to their attacks included in the Grand Alliance and ATSC replies, even for this narrow application, their concerns are tremendously overblown, full of distortion and hyperbole. But more fundamentally, in their myopic focus on stimulating the emergence of "converged" products, they stubbornly refuse to consider many other types of interoperability that are at least as vital as computer interoperability, such as the need to interface seamlessly with other digital terrestrial, cable and satellite television systems emerging here and around the world, *every one* of which uses interlaced scanning, or the requirement that digital receivers also handle analog, interlaced NTSC broadcasts during the transition, or the need to interoperate with the vast installed base of broadcast and consumer equipment, or the need to broadcast archived video programs easily. Indeed, from this broader perspective of interoperability -- the perspective taken by the Advisory Committee, and the one the Commission must take to reflect the public interest -- the counterproposal offered by these members of the computer industry is *far less interoperable* than the ATSC DTV Standard.

Moreover, their complaints consistently reveal a shocking lack of concern or even interest in free over-the-air television or television service of any kind, hardly ever mentioning the words. They are free, of course, to present their myopic concerns to the Commission, and even to use hyperbole and distortion in making their claims, but none of their arguments provides any basis whatsoever for upsetting the solid industry consensus supporting the Advisory Committee recommendation, or for the Commission to turn away from cementing its tentative decision to adopt that recommendation. Accordingly, the Commission should reject their claims and proceed as rapidly as possible to adopt the ATSC DTV Standard and set in motion the implementation of digital broadcast television.

We will not repeat here the detailed discussion and refutation of all of the misunderstandings or inaccurate claims made by these members of the computer industry, but we do offer additional comments on the erroneous cost estimates included in the CICATS submission upon which they base many of their complaints and conclusions.

III. CICATS' Cost Estimates Are Erroneous

Appendix A to the Grand Alliance reply comments filed today gives a detailed discussion of the CICATS cost estimates and develops other, more accurate estimates upon which the Commission may base its judgments. We offer these additional comments based on our extensive experience as a consumer electronics manufacturer, and especially our expertise derived from developing and manufacturing the Direct Satellite System ("DSS") consumer set-top receiver and related equipment used in connection with direct broadcast satellite ("DBS") services.

CICATS claims that the cost of an ATSC DTV converter will be substantially greater than one based on the CICATS baseline format counterproposal[3]. The cost analysis developed by CICATS can most charitably be described as flawed. Their analysis proceeds based on a $500 *retail price* of the DSS set-top receiver. No one in the consumer electronics industry would attempt to develop a reliable cost estimate based on applying various formulas to a retail price. Rather, we would develop a bill of materials based on a specific design. Once solid cost estimates are prepared, they can be used to project reliable retail price estimates[4].

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[3]As discussed in the Grand Alliance and ATSC reply comments, CICATS' focus on the price of converters rather than receivers illustrates their disregard for HDTV. Aside from their faulty cost estimates, their whole comparison is flawed because it compares their proposal for delivering only SDTV with the ATSC DTV Standard which delivers HDTV capability on day one. Even if their cost comparisons were valid, which they are not, they would be proving that bicycles cost less than automobiles, which although true would hardly argue for adopting a two-wheel, chain-drive standard for automobiles.

[4]Thomson has produced over two million DSS set-top receivers, which provides us with significant experience, a detailed bill of materials, and a specific design from which reliable cost estimates can be developed. This knowledge and expertise is reflected in the cost estimates included in Appendix A to the August 12, 1996 Reply Comments of the Grand Alliance.

One mistake that proceeds from CICATS' unusual approach, is that they use a $500 retail price figure for the DSS receiver, when in fact that price includes a satellite dish and a low noise block converter, two costly items that are not required in a DTV converter. They also estimate that 15% of the DSS receiver is not subject to Moore's Law, i.e., it is not the type of electronics susceptible to rapid price/performance improvements. In fact, a review of our detailed cost files indicates that the correct figure is closer to 30%.

Extrapolating from these and other estimates, CICATS determines that the retail price of an ATSC set-top box built today would be $1,350. Marking our own detailed cost estimates up to a retail price level indicates that a fully featured ATSC set-top converter would be in the range of $700 if sold today. (Of course, this price will fall dramatically by the time set-top converters become highly relevant to the transition to DTV. DTV *receiver* prices will be most important in the early years of the transition, and it appears that the transition won't even begin until 1998.)

Thus, we believe that CICATS' estimates of the cost of an ATSC set-top converter are approximately 100% too high. Furthermore, our extensive experience in building digital set-top converters also makes us believe that CICATS has *underestimated* the actual cost of their proposed product by as much as 15% to 20%.

CICATS next applies this excessively high unit cost estimate to an adoption scenario that is completely unrealistic, yielding a $91 billion figure for the cost to consumers of implementing DTV.[5]

Historical experience indicates that consumers adopt new consumer electronics products at a much slower rate than CICATS utilizes. The VCR took six years, and the camcorder took two-to-three years to reach one million units. DSS, the most successful product introduction in the history of consumer electronics, reached one million units in just

[5]Again, their scenario unrealistically looks at DTV as if all consumers would purchase set-top converters to watch SDTV-quality signals on existing television sets. As noted above, we believe it will be the attraction of full HDTV quality on new widescreen sets that will drive the adoption of digital television.

under one year. CICATS assumes a volume of *23 million units* (!) in the first year of DTV (equal to the annual unit sales of color TVs). This is obviously a completely unrealistic volume forecast, and at a price level that is almost double the average price of a color television ($399). Of course, unrealistically high volumes make for unrealistically high aggregate costs, like the $91 billion figure CICATS uses to attempt to impress the Commission. This is especially true when the unrealistically high volumes are applied to the early years before unit costs have been driven down.[6]

By significantly overestimating retail prices and applying completely unrealistic volume projections, CICATS has artificially and grossly inflated the cost to consumers of adopting the products based on the ATSC DTV Standard. Assuming CICATS' false premise for the moment -- that the whole transition could be accurately represented by the adoption of DTV set-top converters -- their erroneous estimates would overstate consumer expenditures by more than $50 billion in the first five years.

And quite apart from all these errors, the CICATS study is fundamentally flawed in that it doesn't reflect the fact that lower-cost models can be introduced during the initial years by using approaches like the all-format decoder that Hitachi America has demonstrated to the Commission and others.[7]

Thus, the cost estimates provided by CICATS, upon which they base their strident arguments against the ATSC DTV Standard, are completely erroneous, and irrelevant in any event. The Commission should give no weight at all to any of their contentions that flow from these figures.

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[6]If DTV sales occurred at double the rate of DSS for the first year, and that rate itself doubled every year (a very optimistic forecast), a total of 62 million units would be sold in the first five years. CICATS predicts 168,466,000 units during this same period.

[7]With these approaches, a decoder can use less memory and less processing power to provide SDTV-quality pictures from any of the ATSC DTV formats, including the HDTV formats.

IV. The Commission Should Reject the CICATS Counterproposal

CICATS, with support from a few other parties whom they have recruited, offers the Commission an alternative system to the one recommended by the Advisory Committee. For a variety of reasons, the Commission should not give credence to this proposal.

Long ago, the Advisory Committee reached a firm conclusion that it would only consider proven, tested systems as candidates for the basis of a new advanced television standard. Accordingly, broadcasters, manufacturers and others spent hundreds of millions of dollars to construct a state-of-the-art testing facility, and the Advisory Committee literally spent years planning, designing, and finally conducting exhaustive laboratory and field tests to ensure that its proposed standard fully met a variety of demanding criteria, including coverage and interference specifications, excellent audio and video quality, affordable consumer receivers, and easy interoperability with other media, including computers and telecommunications. As a result of this process, all segments of the industry are now assured that the proposed standard represents real working equipment with proven, reliable performance claims, giving all of them the confidence they need to proceed to the implementation stage.

The CICATS proposal is just that -- a proposal. It has not been subjected to the scrutiny of a board of technically competent experts, nor undergone any of the peer-review processes of evaluation, certification or testing that have characterized the Advisory Committee's processes. As we understand it, the proposal exists only as a simulation, and no prototype hardware exists. Nor has it been married to a transport system or a transmission system that are necessary to provide a complete working system. Thus, a real system based upon it has never been tested in the laboratory or in a real-world broadcasting environment.[8]

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[8]Moreover, as explained in detail in the ATSC and Grand Alliance comments, the proposal violates the international MPEG-2 video compression standard in a variety of ways, and makes performance claims that are dubious, at best.

And even in its specification, this counterproposal is unacceptable on its face, because it doesn't guarantee a capability from day one to deliver full HDTV quality. Several years ago the Commission made an explicit policy decision that it would not entertain any proposal for mere enhanced-definition television unless it proved impossible to move directly to HDTV in one step. And now it is more apparent than ever that broadcasters need full HDTV quality if they are to compete in the years and decades to come. Perhaps this helps explain why *not a single broadcaster* has endorsed the CICATS proposal.

Several parties claim that this system could be evaluated within a few weeks, and that its adoption would not delay the transition to digital TV at all. These claims are ludicrous on their face. First of all, if the Commission were to decide to evaluate further systems, it could not limit its evaluation to one system, but would have to reopen the entire process, presumably organizing a new Advisory Committee (a daunting prospect). Repeating the process would take several years, not several weeks, with no assurance at all that a better system would result, particularly if the Commission had established a track record of entertaining last-minute, unembodied proposals. The practical impact of such a decision would be that other digital television standards, including the European DVB standard, all of which are *far less interoperable with computers* than the ATSC DTV Standard, would become entrenched in the marketplace, leaving U.S. terrestrial broadcasters stranded in an analog world, waiting for digital capability, while their competitors thrive with higher quality television and new, innovative services.[9]

These comments began by noting two key elements that broadcasters must have to move forward: a single, complete standard endorsed by the Commission, with *proven, tested performance*; and full HDTV capability guaranteed from day one. The CICATS

[9]Not surprisingly, the principal opponents of adopting the ATSC DTV Standard, the cable industry and some members of the computer industry, are precisely the groups who compete with over-the-air broadcasters and television set manufacturers. These opponents would gain an enormous competitive advantage if free over-the-air television languished in an analog low-resolution world and became a second-class video service, but such a result flies in the face of the Commission's primary goal in this proceeding.

counterproposal offers neither of these. Moreover, there is a strong, broad industry consensus in support of the ATSC DTV Standard. By contrast, with good cause, there is no support whatsoever among those directly involved in the provision of broadcast television service for the CICATS proposal. The Commission has no basis whatever for adopting the CICATS proposal, and it would be foolhardy to start over with a new evaluation process. Consequently, the Commission should reject the CICATS proposal.

V. Conclusion

Those who oppose setting any standard at all, and those who oppose the ATSC DTV Standard in particular, have utterly failed to meet the burden of proof the Commission wisely required for changing its tentative decision to adopt the ATSC DTV Standard for use by digital terrestrial broadcast licensees. At the same time, virtually every party *directly* involved in the provision of free over-the-air television service strongly supports the need for a single, complete, mandated standard, and enthusiastically endorses the ATSC DTV Standard recommended by the Advisory Committee. Bearing in mind the Commission's paramount objective in this proceeding -- protecting and preserving the vitality of free over-the-air television -- the course wherein the public interest lies could hardly be more clear: the Commission should adopt the ATSC DTV Standard posthaste.

Our nation has the world's best digital television technology firmly in hand, offering quantum improvements in video and audio quality, plus a host of potential information services as well. To capitalize on the incredible effort and investment of the past decade, all that remains is for the Commission to act. Accordingly, Thomson urges the Commission as expeditiously as possible to adopt the entire ATSC DTV Standard as the single standard for

digital terrestrial television licensees. By so doing, the Commission will let loose a torrent of investment that will bring the benefits of this fertile new technology to the American people, while creating and preserving jobs and promoting economic growth.

Respectfully submitted,

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